

CLAIMS

What is claimed is:

1. A method for calibrating a sensor comprising:
compiling an array of data relating to the sensor;
adjusting a nominal output current of the sensor a first time based on data in the array;
and
adjusting a curve representing the sensor output based on data in the array and the
adjusted value of the nominal output current.
2. The method of Claim 1, wherein compiling an array comprises compiling historical data.
3. The method of Claim 2, wherein the historical data comprises measured blood glucose
readings.
4. The method of Claim 1, wherein compiling an array comprises compiling recent data.
5. The method of Claim 4, wherein the recent data comprises electrode readings.
6. The method of Claim 5, wherein the electrode readings comprise glucose electrode
readings and oxygen electrode readings.
7. The method of Claim 4, wherein the recent data comprises measured blood glucose
concentrations.
8. The method of Claim 7, wherein the nominal output current is a nominal glucose current.
9. The method of Claim 8, wherein the nominal glucose current is adjusted based on a shift
of measured data points with respect to blood glucose readings.
10. The method of Claim 9, wherein the shift is a mean shift.

11. The method of Claim 1, wherein adjusting the curve representing the sensor output comprises performing a linear regression on data in the array.
12. The method of Claim 11, wherein a result of the linear regression determines a first calibration point.
13. The method of Claim 12, wherein the first calibration point is used to determine a plurality of calibration points.
14. The method of Claim 1, wherein adjusting the curve representing the sensor output comprises adjusting the curve in a piecewise linear fashion.
15. The method of Claim 14, wherein a number of pieces in the piecewise linear adjustment is five.
16. The method of Claim 1, further comprising adjusting the nominal output current of the sensor a second time based on data in the array.
17. The method of Claim 16, wherein the nominal output current is a nominal glucose current.
18. The method of Claim 17, wherein the nominal glucose current is adjusted based on a shift of measured data points with respect to blood glucose readings.
19. The method of Claim 18, wherein the shift is a mean shift.
20. The method of Claim 1, further comprising establishing a new sensor output based on the adjusted curve and the twice adjusted sensor parameter
21. An implantable sensing system comprising:
 - a sensor for sensing a biological parameter;
 - a processor connected to the sensor for processing the parameter; and

a drug delivery unit connected to the processor for responding to the processor based on the parameter,

wherein the processor is programmed to adjust an output of the sensor by
compiling an array of data relating to the sensor;
adjusting a sensor parameter a first time based on data in the array;
adjusting a curve representing the sensor output based on data in the array; and
adjusting the sensor parameter a second time based on data in the array.

22. The system of Claim 21, wherein the sensor is a glucose sensor.
23. The system of Claim 21, wherein the drug delivery unit is an insulin pump.
24. The system of Claim 21, wherein the insulin pump delivers insulin in response to the sensed parameter.
25. The method of Claim 21, wherein compiling an array comprises compiling historical data.
26. The method of Claim 25, wherein the historical data comprises measured blood glucose readings.
27. The method of Claim 21, wherein compiling an array comprises compiling recent data.
28. The method of Claim 27, wherein the recent data comprises glucose electrode readings and oxygen electrode readings.
29. The method of Claim 27, wherein the recent data comprises measured blood glucose concentrations.
30. The method of Claim 21, wherein adjusting a sensor parameter a first time comprises adjusting a nominal glucose current.

31. The method of Claim 21, wherein adjusting the curve representing the sensor output comprises performing a linear regression on data in the array.
32. The method of Claim 21, wherein adjusting the curve representing the sensor output comprises adjusting the curve in a piecewise linear fashion.
33. A sensor calibration system comprising:
means for compiling an array of data relating to the sensor;
means for adjusting a sensor parameter a first time based on data in the array;
means for adjusting a curve representing the sensor output based on data in the array; and
means for adjusting the sensor parameter a second time based on data in the array.
34. A method for calibrating a sensor comprising:
generating a calibration curve based on *a priori* empirical values;
compiling a plurality of data values from the sensor;
compiling independent historical values of a parameter sensed by the sensor; and
reconciling the plurality of data values from the sensor to the calibration curve using the independent historical values.
35. The method of Claim 34, wherein the sensor is a glucose sensor.
36. The method of Claim 34, wherein generating a calibration curve comprises compiling *a priori* empirical values of sensors similar to the sensor being calibrated.
37. The method of Claim 34, wherein generating a calibration curve comprises generating a calibration curve representing a sensor having a plurality of phases.
38. The method of Claim 34, wherein the independent historical values of a parameter sensed by the sensor are metered blood glucose values.
39. The method of Claim 34, wherein reconciling the plurality of data values comprises adjusting an output current of the sensor.

40. The method of Claim 39, wherein the output current of the sensor is a nominal glucose current.

41. The method of Claim 40, wherein the nominal glucose current is adjusted based on a shift of the plurality of data values from the sensor with respect to metered blood glucose values.

42. The method of Claim 34, wherein reconciling the plurality of data values comprises performing a linear regression on the plurality of data values.

43. The method of Claim 34, wherein reconciling the plurality of data values is performed in a piecewise linear fashion.